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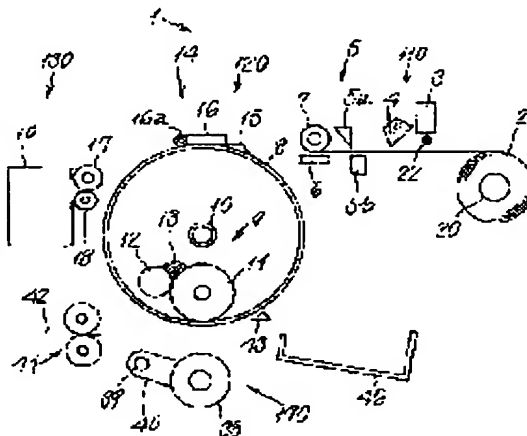
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(54) MASTER FOR STENCIL PROCESS PRINTING, MASTER MAKING METHOD AND DEVICE, STENCIL
 PROCESS PRINTING DEVICE AND METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To eliminate a non-conforming state such as printing irregularities due to the presence of a porous support for a master and enable a printing process to be performed with the help of the master showing excellent conveyance performance and high print quality.

SOLUTION: The master 2 wrapped in the form of a roll is formed of only a porous resin film and a solvent 22 is applied to a part corresponding to a non-image part by a solvent application means 3 and thereby an ink non-passable part is formed to make the master. The site melted by applying the solvent 22 is dried/hardened by a drying means 4. The master 2 through with a making process is wrapped around the outer circumferential surface of a printing drum 8 and printing is performed.



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CLAIMS

[Claim(s)]

- [Claim 1] The master for mimeograph printing characterized by consisting only of porous resin film in the master for mimeograph printing engraved based on image information.
- [Claim 2] It is the master for mimeograph printing characterized by having the structure where the above-mentioned porous resin film has many openings in the membranous interior and a membranous front face in the master for mimeograph printing according to claim 1.
- [Claim 3] The master for mimeograph printing characterized by the above-mentioned opening continuing and existing in the membranous thickness direction in the master for mimeograph printing according to claim 2.
- [Claim 4] The master for mimeograph printing to which thickness of the above-mentioned porous resin film is characterized by 5-micrometer or more being 50 micrometers or less in claim 1 thru/or the master for mimeograph printing of one of 3 publications.
- [Claim 5] It sets to claim 1 thru/or the master for mimeograph printing of one of 3 publications, and the consistency of the above-mentioned porous resin film is 0.1 g/cm³. It is 0.7 g/cm³ above. Master for mimeograph printing characterized by being the following.
- [Claim 6] The master for mimeograph printing to which the average aperture of the above-mentioned porous resin film is characterized by 5-micrometer or more being 30 micrometers or less in claim 1 thru/or the master for mimeograph printing of one of 3 publications.
- [Claim 7] The platemaking approach characterized by engraving processing so that ink cannot pass the part corresponding to the non-image section based on the image information for the master for mimeograph printing which consists only of porous resin film.
- [Claim 8] The platemaking approach characterized by processing in the platemaking approach according to claim 7 so that ink's cannot be passed being applying a solvent.
- [Claim 9] The platemaking approach characterized by making it dry compulsorily [after applying the above-mentioned solvent] in the platemaking approach according to claim 8.
- [Claim 10] The platemaking approach characterized by the above-mentioned solvent being that in which the above-mentioned porous resin film is dissolved in the platemaking approach according to claim 8 or 9.
- [Claim 11] The platemaking approach characterized by the above-mentioned solvent being the thing which makes the above-mentioned porous resin film swell in the platemaking approach according to claim 8 or 9.
- [Claim 12] The platemaking approach characterized by processing in the platemaking approach according to claim 7 so that ink's cannot be passed being carrying out heating fusion with a heating means.
- [Claim 13] The platemaking approach characterized by making it cool compulsorily [after carrying out heating fusion] in the platemaking approach according to claim 12.
- [Claim 14] The platemaking approach characterized by making the stripped plane in the manufacture of the above-mentioned porous resin film into a platemaking side in claim 7 thru/or the platemaking approach of one of 13 publications.
- [Claim 15] Platemaking equipment characterized by having the ink non-passed section means forming processed so that ink cannot pass the part corresponding to the non-image section based on the image information of the master for mimeograph printing which consists only of porous resin film.
- [Claim 16] Platemaking equipment characterized by being a solvent spreading means by which the above-mentioned ink non-passed section means forming applies a solvent to the part corresponding to the non-image section in platemaking equipment according to claim 15.
- [Claim 17] Platemaking equipment characterized by having the desiccation means on the master conveyance direction lower stream of a river of the above-mentioned solvent spreading means in platemaking equipment according to claim 16.
- [Claim 18] Platemaking equipment characterized by the above-mentioned solvent being that in which the above-mentioned porous resin film is dissolved in platemaking equipment according to claim 16 or 17.
- [Claim 19] Platemaking equipment characterized by the above-mentioned solvent being the thing which makes the above-mentioned porous resin film swell in platemaking equipment according to claim 16 or 17.
- [Claim 20] Platemaking equipment characterized by being a heating means by which the above-mentioned ink non-passed section means forming carries out heating fusion of the part corresponding to the non-image section in platemaking equipment according to claim 15.
- [Claim 21] Platemaking equipment characterized by having the cooling means on the master conveyance direction

lower stream of a river of the above-mentioned heating means in platemaking equipment according to claim 20.
[Claim 22] Platemaking equipment characterized by making the stripped plane in the manufacture of the above-mentioned porous resin film into a platemaking side in claim 15 thru/or the platemaking equipment of one of 21 publications.

[Claim 23] The mimeograph airline printer with which the master for mimeograph printing is engraved with platemaking equipment based on image information, and the above-mentioned platemaking equipment is characterized by being one of claim 15 thru/or 22 things in the mimeograph airline printer which prints by twisting the master for mimeograph printing which engraved around the peripheral face of a print drum.

[Claim 24] The mimeograph printing approach characterized by looping the peripheral face of a print drum around the master for mimeograph printing which engraved processing so that ink cannot pass the part corresponding to the non-image section based on the image information for the master for mimeograph printing which consists only of porous resin film, and engraved, and printing by supplying ink from the interior of a print drum.

[Claim 25] The printing approach characterize by loop the peripheral face of a print drum around the master for mimeograph printing which engraved process so that ink cannot pass the part corresponding to the non-image section based on the image information for the master for mimeograph printing which consist only of porous resin film , and engraved so that the platemaking side may become inside , and print by supply ink from the interior of a print drum .

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the mimeograph printing approach using the platemaking approach of the master for mimeograph printing which has an ink passage hole, and this master for mimeograph printing, the platemaking equipment of this master for mimeograph printing, the mimeograph airline printer using this master for mimeograph printing, and this master for mimeograph printing.

[0002]

[Description of the Prior Art] With a mimeograph airline printer, the peripheral face of a print drum (printing cylinder) is looped around the master for mimeograph printing (only henceforth a master) which carried out punching platemaking with platemaking equipment, ink is supplied from the interior of a print drum, and printing is made by pressing a print sheet to the peripheral face of a print drum by press members, such as a press roller. The print drum has the mesh screen layer which are a porous support cylinder object and gauze of resin or a metal fiber, and a master is looped around on this mesh screen layer. If a print sheet is pressed by the print drum by press members, such as a press roller, the ink supplied to the inner skin of a print drum will ooze out from the aperture of a print drum, and the punch station of a master, and will transfer to a print sheet.

[0003] The master used with a mimeograph airline printer has structure which prepared the stick prevention layer for stick prevention [on lamination and a film front face] of the porous tissue paper as an ink permeability base material (only henceforth a base material) etc. with a thermal head in the thermoplastics film (only henceforth a film). The master for sensible-heat mimeograph printing which prepared the film in what mixed hemp fiber or hemp fiber, and a synthetic fiber and wood fiber as porous tissue paper in practice, and prepared the stick prevention layer in lamination and a film front face with adhesives is used widely.

[0004] However, there are the following troubles in the above-mentioned master for sensible-heat mimeograph printing.

** Adhesives should pile up the part with which fiber lapped, and the part which a film touches in the shape of [of a bird] a paddle, and punching by the thermal head should become is hard to be performed in the part.

** Fiber itself should bar passage of ink and printing nonuniformity should occur.

** Fiber is expensive and a master should also become expensive inevitably.

** The process on which a film and a base material are pasted up is required, and serves as cost quantity.

Moreover, each cost of materials is also this thing.

[0005] Coating and the master for sensible-heat mimeograph printing which dried and carried out the laminating of the porous resin film as a base material are proposed on one field of a thermoplastics film in order to attain high definition-ization in JP,10-24667,A. According to this master, although the trouble of the above-mentioned ** - ** is solved, in order to require coating and a desiccation process, a problem equivalent to the trouble of ** remains. Moreover, at the time of master looping around whose print drum has been engraved, although the aperture of a print drum and the corresponding base material part were filled up with ink, since ink was discarded with the base material at the time of the ** version, when an image ratio was the printed matter which is about 10%, the ink which can be printed dozens of sheets will be discarded for every ** version, and there was a problem that the consumption of ink increased, for example.

[0006] The master for sensible-heat mimeograph printing which does not use a base material and which consists only of a thermoplastics film substantially is proposed by JP,54-33117,A. According to this master, since a base material does not exist, all the troubles of the above-mentioned ** resulting from a base material - ** are solved, and the problem of ink consumption increase is also solved.

[0007]

[Problem(s) to be Solved by the Invention] However, in the case of the master for sensible-heat mimeograph printing which consists only of a thermoplastics film substantially, a new problem is produced. That is, although the rate of a heat shrink of a film is high, saccavous [by the thermal head] has good film thickness and printing quality excels [thickness] in the film 3 micrometers or less, the waist has the problem that it is weak and conveyance is difficult. If a thick film is used in order to improve conveyance nature, saccavous [by the thermal head] will fall and printing nonuniformity will occur.

[0008] Then, this invention sets offer of the mimeograph printing approach using the mimeograph airline printer and this master which have the platemaking approach of the master for mimeograph printing excellent in conveyance nature and printing quality, and this master, platemaking equipment, and this platemaking equipment as the purpose

while it can solve all the above-mentioned problems resulting from a base material.

[0009]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, paying attention to the porous resin film which existed as a base material of a thermoplastics film in the former, this porous resin film having ink permeability and nerve itself is used for this invention as a master. The porous resin film has already had the hole which the punch station as an ink passage hole conventionally formed based on image information by the thermal head deserves in the manufactured phase, and it will be equivalent to the conventional platemaking actuation in this invention to make the part corresponding to the non-image section (non-image section in an image field) into ink the non-passed section among many holes which already exist. Specifically by invention according to claim 1, the configuration of consisting only of porous resin film is taken in the master for mimeograph printing engraved based on image information.

[0010] In invention according to claim 2, the above-mentioned porous resin film has taken the configuration of having the structure which has many openings in the membranous interior and a membranous front face, in the master for mimeograph printing according to claim 1.

[0011] In invention according to claim 3, the configuration that the above-mentioned opening continues and exists in the membranous thickness direction is taken in the master for mimeograph printing according to claim 2.

[0012] In invention according to claim 4, the thickness of the above-mentioned porous resin film has taken the configuration that it is 5 micrometers or more 50 micrometers or less, in claim 1 thru/or the master for mimeograph printing of one of 3 publications.

[0013] In invention according to claim 5, it sets to claim 1 thru/or the master for mimeograph printing of one of 3 publications, and the consistency of the above-mentioned porous resin film is 0.1 g/cm³. It is 0.7 g/cm³ above. The configuration that it is the following is taken.

[0014] In invention according to claim 6, the average aperture of the above-mentioned porous resin film has taken the configuration that it is 5 micrometers or more 30 micrometers or less, in claim 1 thru/or the master for mimeograph printing of one of 3 publications.

[0015] In invention according to claim 7, the procedure of engraving while processing so that ink cannot pass the part corresponding to the non-image section based on the image information for the master for mimeograph printing which consists only of porous resin film is taken.

[0016] In invention according to claim 8, processing so that ink cannot be passed has taken the procedure of being applying a solvent, in the platemaking approach according to claim 7.

[0017] In invention according to claim 9, in the platemaking approach according to claim 8, after applying the above-mentioned solvent, the procedure of making it dry compulsorily is taken.

[0018] In invention according to claim 10, the procedure in which the above-mentioned solvent is that in which the above-mentioned porous resin film is dissolved is taken in the platemaking approach according to claim 8 or 9.

[0019] In invention according to claim 11, the procedure in which the above-mentioned solvent is the thing which makes the above-mentioned porous resin film swell is taken in the platemaking approach according to claim 8 or 9.

[0020] In invention according to claim 12, processing so that ink cannot be passed has taken the procedure of being carrying out heating fusion with a heating means, in the platemaking approach according to claim 7.

[0021] In invention according to claim 13, in the platemaking approach according to claim 12, after carrying out heating fusion, the procedure of making it cool compulsorily is taken.

[0022] In invention according to claim 14, the procedure of making the stripped plane in the manufacture of the above-mentioned porous resin film into a platemaking side is taken in claim 7 thru/or the platemaking approach of one of 13 publications.

[0023] In invention according to claim 15, the configuration of having the ink non-passed section means forming processed so that ink cannot pass the part corresponding to the non-image section based on the image information of the master for mimeograph printing which consists only of porous resin film is taken.

[0024] In invention according to claim 16, the above-mentioned ink non-passed section means forming has taken the configuration that it is a solvent spreading means to apply a solvent to the part corresponding to the non-image section, in platemaking equipment according to claim 15.

[0025] In invention according to claim 17, the configuration of having the desiccation means on the master conveyance direction lower stream of a river of the above-mentioned solvent spreading means is taken in platemaking equipment according to claim 16.

[0026] In invention according to claim 18, the configuration that the above-mentioned solvent is that in which the above-mentioned porous resin film is dissolved is taken in platemaking equipment according to claim 16 or 17.

[0027] In invention according to claim 19, the configuration that the above-mentioned solvent is the thing which makes the above-mentioned porous resin film swell is taken in platemaking equipment according to claim 16 or 17.

[0028] In invention according to claim 20, the above-mentioned ink non-passed section means forming has taken the configuration that it is the heating means which carries out heating fusion of the part corresponding to the non-image section, in platemaking equipment according to claim 15.

[0029] In invention according to claim 21, the configuration of having the cooling means on the master conveyance direction lower stream of a river of the above-mentioned heating means is taken in platemaking equipment according to claim 20.

[0030] In invention according to claim 22, the configuration of making the stripped plane in the manufacture of the above-mentioned porous resin film into a platemaking side is taken in claim 15 thru/or the platemaking equipment of

one of 21 publications.

[0031] In invention according to claim 23, based on image information, the master for mimeograph printing was engraved with platemaking equipment, and the above-mentioned platemaking equipment has taken the configuration that it is one of claim 15 thru/or 22 things, in the mimeograph airline printer which prints by twisting the master for mimeograph printing which engraved around the peripheral face of a print drum.

[0032] In invention according to claim 24, the peripheral face of a print drum was looped around the master for mimeograph printing which engraved processing so that ink cannot pass the part corresponding to the non-image section based on the image information for the master for mimeograph printing which consists only of porous resin film, and engraved, and the procedure of printing by supplying ink from the interior of a print drum is taken.

[0033] The peripheral face of a print drum was looped around the master for mimeograph printing which engraved processing so that ink cannot pass the part corresponding to the non-image section based on the image information for the master for mimeograph printing which consists only of porous resin film in invention according to claim 25, and engraved so that the platemaking side might become inside, and the procedure of printing by supplying ink from the interior of a print drum is taken.

[0034]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained based on drawing. First, based on drawing 1, the outline of the whole configuration of the mimeograph airline printer in this operation gestalt is explained. The mimeograph airline printer 1 mainly consists of the platemaking equipment 110 which engraves a master 2, a printing means 120, a ** version means 130, and press means 170 grade. The master supporter material 20 supported for the master 2 which platemaking equipment 110 is arranged in the abbreviation center-section upper part of a mimeograph airline printer body, and was ****(ed) in the shape of a roll, enabling free rotation, it has the solvent spreading means 3 as ink non-passed section means forming, the desiccation means 4, a cutting means 5 to cut a master 2 in the location of predetermined die length, the guide plate 6 that guides conveyance of a master 2, and the conveyance roller 7 grade which conveys a master 2 (claims 15, 16, 17, and 23).

[0035] Although the solvent spreading means 3 does not apply the solvent which dissolves a master 2 in the part corresponding to the non-image section in pinpoint alternatively on the whole surface of a master 2 based on the inputted image information and does not illustrate it, it has the tank by which it filled up with the solvent, and the discharge head which consists of a heater element, a piezoelectric device, etc. The desiccation means 4 is located in the master conveyance direction lower stream of a river of the solvent spreading means 3, has the blower fan, and has the function which brings forward desiccation and solidification of the dissolution part of a master 2 (claims 17 and 23). It is good also as a configuration which sprays warm air, using a heating means as a desiccation means 4. The cutting means 5 is located in the master conveyance direction lower stream of a river of the desiccation means 4, and has upper cutting-edge 5a and lower cutting-edge 5b. Making a master 2 contact a guide plate 6, the conveyance roller 7 is conveyed in order to make it hold for a maintenance means 14 to mention the point of a master 2 later.

[0036] The printing means 120 is arranged in the left-hand side lower part in drawing of platemaking equipment 110, and mainly consists of a print drum 8 and an ink supply means 9 formed in the interior of this print drum 8. Although not illustrated, it has the mesh screen layer which are a porous support cylinder object and gauze of resin or a metal fiber, aperture 8a is formed in the peripheral face, and the print drum 8 is formed for the surroundings of the support shaft 10 which served as the ink delivery pipe, enabling free rotation. The support shaft 10 has two or more puncturing on the front face, and supplies ink to the ink supply means 9 from the puncturing. The ink supply means 9 has composition of an inking roller 11 and the common knowledge which supplies the ink of ink ***** 13 which has the doctor roller 12 grade, was supplied from the support shaft 10, and made the wedge shape to the inner skin of a print drum 8.

[0037] The maintenance means 14 is established on the peripheral face of a print drum 8. The maintenance means 14 has the clasper 16 which pinches the stage section 15 constituted by the flat surface which extends along with the bus-bar of a print drum 8, and the point of a master 2. The clasper 16 is formed on the peripheral face of a print drum 8 at pivot 16a supported free [rotation], and the bottom closing motion drive of the timing predetermined with the closing motion means which is not illustrated is carried out. The ** version means 130 is arranged in the left-hand side of a print drum 8, and has the ***** version roller 17, the ***** version roller 18, and the ** version box 19 grade that stores the used master 2. The rotation drive of the ***** version roller 17 and the ***** version roller 18 is carried out by the driving means which is not illustrated, and the ***** version roller 17 is formed free [attachment and detachment] to the peripheral face of a print drum 8 by the attachment-and-detachment means which is not illustrated. The ** version box 19 is formed free [attachment and detachment] to the mimeograph airline printer body.

[0038] A press means 170 by which the print drum 8 was formed caudad has the press roller 38, the arm shaft 39, and the press roller arm pair 40 grade. the arm shaft 39 is supported free [rotation] to the case side plate which is not illustrated — having — **** — a press roller arm pair — 40 is being fixed to the arm shaft 39 in the end section. The press roller 38 attaches and detaches to a print drum 8 by the cam which is not illustrated while being energized towards the print drum 8 by the spring member which is supported by the other end of a press roller 38 free [rotation], and does not illustrate the shank. Moreover, the press roller 38 is held by the stop means which is not illustrated in the location estranged from the print drum 8 except the time of ****.

[0039] the lower part of the ** version means 130 — a resist roller pair — 41 is prepared. the print sheet 42 to which paper was fed by the feed means which is not illustrated — a resist roller pair — after once being stopped by

41 and correcting a skew etc., it is conveyed towards the impression part of a print drum 8 to predetermined timing. Synchronizing with this timing, the above-mentioned press roller 38 contacts a print drum 8. Near the lower part of the both ends of a print drum 8, the exfoliation pawl 43 which makes a print sheet 42 exfoliate is formed from the peripheral face of a print drum 8, each exfoliation pawl 43 is rotated by the driving means which is not illustrated, and the point attaches and detaches to the peripheral face of a print drum 8. The paper output tray 46 which loads a print sheet [finishing / printing] into the method of the right of a print drum 8 is arranged, and this paper output tray 46 is being fixed to the mimeograph airline printer body.

[0040] As shown in drawing 2, the master 2 in this operation gestalt consists of only porous resin film made of thermoplastics (claim 1), and consists of opening 2bs (void section) formed in resin section 2a (black solid section), and the membranous interior and a membranous front face (claim 2). [much] The structure where opening 2b continues in the thickness direction in the film from a viewpoint of the permeability of ink is desirable (claim 3).

[0041] 2 micrometers or more 50 micrometers or less of average apertures of the porous resin film 2 (henceforth a master 2), i.e., the pitch diameter of opening 2b, is 5 micrometers or more 30 micrometers or less desirably (claim 6). Ink permeability is bad when an average aperture does not fulfill 2 micrometers. Therefore, if hypoviscosity ink is used in order to obtain sufficient ink through put, a blot will arise in an image or the phenomenon in which ink oozes out will arise from the flank of a print drum 8, or the back end of the master 2 looped around during printing. Moreover, the voidage in the porous resin film 2 becomes low in many cases, and it becomes easy to check the permeability of ink.

[0042] On the other hand, when an average aperture exceeds 50 micrometers, the depressor effect of the amount of imprints of the ink by the porous resin film 2 becomes low, the ink between print drums 8 is superfluously extruded at the time of printing, and faults, such as soiling on the back of paper and a blot, occur. That is, even if an average aperture is too small and it is too large, good printing quality is not acquired. Since it is especially hard coming to pass ink so that the porous resin film 2 is thick when the average aperture of opening 2b in the porous resin film 2 is 20 micrometers or less, the amount of imprints to the print sheet of ink is controllable by the thickness of the porous resin film 2.

[0043] Since printing nonuniformity may be produced when the thickness of the porous resin film 2 is uneven, the uniform thing of thickness is desirable. 2 micrometers or more of 100 micrometers or less of thickness of the porous resin film 2 in this operation gestalt are 5 micrometers or more and 50 micrometers or less desirably (claim 4). When not fulfilling 5 micrometers, print durability may fall and elongation may occur in an image. The consistencies of the porous resin film 2 are usually 0.01 g/cm³. It is 1 g/cm³ above. It is the following and they are 0.1 g/cm³ desirably. It is 0.7 g/cm³ above. It is the following (claim 5). Consistencies are 0.01 g/cm³. Membranous reinforcement runs short that it is the following, and the film itself tends to break. The coating weight of the porous resin film 2 is 0.1 g/m². It is 35 g/m² above. They are 0.5 g/m² - 25 g/m², especially 1 - 11 g/m² desirably hereafter. It is desirable. Increase of coating weight bars passage of ink, worsens image quality, and is 0.1 g/m². Below control of the amount of ink imprints becomes difficult, and they are 35 g/m² conversely. Above, passage of ink is barred and image quality is worsened.

[0044] As a resin ingredient which constitutes the porous resin film 2, cellulose, such as polyamides, such as vinyl system resin, such as polyvinyl acetate, a polyvinyl butyral, a vinyl chloride-vinyl acetate copolymer, a vinyl chloride-vinylidene-chloride copolymer, a vinyl chloride-acrylonitrile copolymer, and a styrene-acrylonitrile copolymer, polybutylene, and nylon, polyphenylene oxide, acrylic ester (meta), a polycarbonate, polyurethane, an acetyl cellulose, acetyl butyl cellulose, and an acetyl propyl cellulose, etc. are mentioned. Each resin may mix and use two or more sorts.

[0045] In order to adjust formation of the porous resin film 2, reinforcement, the magnitude of an aperture, etc., it is desirable to add additives, such as a filler, if needed in the porous resin film 2. In here, a filler is a concept containing a pigment, fine particles, or fibrous material. An especially needlelike filler is desirable in it. As the example, tabular fillers, such as artificial-mineral system needlelike fillers, such as mineral system needlelike fillers, such as a magnesium silicate, sepiolite, potassium titanate, wollastonite, zonolite, and gypsum-fibrosus fiber, a non-oxide system needlelike whisker, an oxide system whisker, and a multiple oxide system whisker, a mica, a glass flake, and talc, are mentioned. Pigments are organic polymer particles, such as not only inorganic but an organic pigment or polyvinyl acetate, a polyvinyl chloride, and polymethylacrylate, and a zinc oxide, a titanium dioxide, a calcium carbonate, and a silica. The microcapsule by Matsumoto Yushi-Seiyaku, Inc. and the Matsumoto microphone loss fire can also be used effectively.

[0046] As an addition of these additives, it is 5% - 200% to resin preferably. At 5% or less, the bending stiffness by adding an additive does not become high. Conversely, at 200% or more, bending stiffness becomes high too much. On the porous resin film 2, an antistatic agent, a stick inhibitor, a surfactant, antiseptics, *****, etc. can be used together within limits which do not check the ink non-passed section formation function mentioned later.

[0047] Next, the formation approach of the master 2 (porous resin film) in this operation gestalt is explained.

(The 1st formation approach) The coating liquid which dissolved and/or distributed and obtained resin in the mixed solvent of a good solvent and a poor solvent is applied to the base material of non-adhesion, and porous membrane is formed in a desiccation process. At this time, the combination which is easy to evaporate at low temperature is relatively more nearly required for a good solvent than a poor solvent. When using a good solvent and a poor solvent a kind every, respectively, the boiling point of a good solvent must be relatively lower than the boiling point of a poor solvent. Although selection of a good solvent and a poor solvent is arbitrary, when a boiling point difference is generally 15-40 degrees C, the porous resin film with a desired property is easy to be formed. When a boiling point

difference is less than 10 degrees C, the evaporation time difference of both solvents is small, and the film formed cannot become porous structure easily. Since desiccation takes time amount and it is inferior to productivity when the boiling point of a poor solvent is too high, as for the boiling point of a poor solvent, it is desirable that it is 150 degrees C or less.

[0048] Although the resin concentration in coating liquid changes with ingredients to be used, it is 5 – 30%. At less than 5%, the diameter of opening becomes large too much, or it is easy to produce the unevenness of the thickness of the porous resin film. On the contrary, if it exceeds 30%, even if the porous resin film will be formed, and it will be hard or it will be formed, an aperture becomes small and a desired property is hard to be acquired. The magnitude of the average aperture of the porous resin film is influenced of the poor solvent in an ambient atmosphere, its amount of coagulation increases, so that the rate to the good solvent is generally high, and an average aperture becomes large. Since the addition ratio of a poor solvent changes with resin and solvents, an experiment needs to determine it suitably. Generally, the aperture of the porous resin film becomes large as the addition of a poor solvent increases. If there are too many additions of a poor solvent, resin will deposit and coating liquid will become unstable.

[0049] (The 2nd formation approach) On the base material of non-adhesion, it applies and dries and the fluid which is indicated by JP,11-235885,A and which makes W/O emulsion a subject is formed. It is the approach the part of water mainly serves as a hole which the ink after desiccation passes, and the resin in a solvent (additives, such as a filler and an emulsifier, may be contained) serves as the structure. In order to adjust formation of porous membrane, reinforcement, the magnitude of an aperture, chewiness, etc. also in this approach, additives, such as said filler, can be added if needed in porous membrane. A needle and a tabular or fibrous filler are desirable especially in it. In formation of W/O emulsion, it is HLB with oleophilic [comparatively strong] (HydrophobicLyophilic Balance).

Although the surfactant of 4-6 is effective, if HLB uses the surfactant of 8-20 also for a water layer, more stable and uniform W/O emulsion will be obtained. Use of a giant-molecule surface active agent is also one of the approaches which obtains a more stable and uniform emulsion. Moreover, addition of thickeners, such as polyvinyl alcohol and polyacrylic acid, is effective in stabilization of an emulsion to a drainage system. In addition, the formation approach of the porous resin film is not the meaning limited to above two.

[0050] As a spreading method of the coating liquid for porous resin film formation, spreading methods generally used conventionally, such as a blade, a transfer roll, a wire bar, a reverse roll, gravure, and a die, can be adopted, and it is not limited especially. The porous resin film is obtained by exfoliating from the base material of non-adhesion, after applying and drying to the base material of non-adhesion and being formed in it. Uniform platemaking is performed and the stripped plane at this time is good, if smooth nature makes this stripped plane a platemaking side preferably from a good thing.

[0051] Printing actuation of the mimeograph airline printer 1 based on the above-mentioned configuration is explained below. A start signal is sent by laying a manuscript 47 (referring to drawing 3) in the manuscript read station which the mimeograph airline printer 1 does not illustrate, performing actuation of setting up the image field 48 of the manuscript 47 printed with a print drum 8 with printing area assignment equipments, such as a digitizer, and pushing the start key on the control panel which is not illustrated. A manuscript 47 is conveyed by the manuscript transport device which is not illustrated, is changed into an electrical signal by CCD (charge-coupled device) which the optical information does not illustrate, and is written in the memory apparatus which the digital signal does not illustrate via the A/D converter which is not illustrated. While the driving means which can come, simultaneously a print drum 8 does not illustrate operates and a print drum 8 rotates in the direction of a clockwise rotation, it is rocked with the rocking means which the ***** version roller 17 of the ** version means 130 does not illustrate, and the peripheral face of a print drum 8 is contacted. The used master 2 exfoliates from the peripheral face of a print drum 8 with the ***** version roller 17, and the master 2 which exfoliated is held in the ** version box 19.

[0052] Next, a print drum 8 is rotated and it stops until the driving means which carries out the rotation drive of the print drum 8 operates and the maintenance means 14 arrives at the predetermined ** version location. If the maintenance means 14 arrives at the predetermined ** version location, the closing motion means which is not illustrated will operate and a clammer 16 will be rotated in the direction which separates from the stage section 15. The stepping motor which is not illustrated operates to this and abbreviation coincidence, the conveyance roller 7 starts rotation to them, and a master 2 is conveyed to them. The master 2 is ****(ed) in the shape of a roll so that the stripped plane in the manufacture may turn into a front face. The discharge head of the solvent spreading means 3 drives said digital signal being read from said memory apparatus, and the platemaking to the master 2 in platemaking equipment 110 is started. A solvent 22 is applied to a master 2 from a discharge head to the non-image section in the part 49 corresponding to the image field 48 of the manuscript 47 shown in drawing 3 (non-punch station in the image field in the former) (claims 7, 8, 18, and 23). In drawing 3 , a sign 50 (hatching display) shows fields other than an image field.

[0053] As for the solvent 22, the good solvent thing is chosen to resin section 2a of the porous resin film 2. As shown in drawing 4 , resin section 2a corresponding to the non-image section is dissolved with a solvent 22, it deforms, and opening 2b is closed (claim 10). By ventilation being performed by the desiccation means 4 and drying, ink non-passed section 2c is formed on a master 2 (claim 9). In drawing 4 , sign 49a shows the ink passage section (about the punch station in the former). Since the master 2 is ****(ed) so that it may become a front face (top face) about the stripped plane in the manufacture, platemaking is made in this stripped plane (claims 14 and 22). In addition, since press a print sheet 42 to a master 2, ink is made to imprint and an image is obtained, ink non-passed

section 2c on a master 2 is a mirror image to the manuscript 47. Even if it does not come to make it dissolve, by making resin section 2a swell, opening 2b may be closed and a solvent which forms ink the non-passed section may be used (claims 11, 19, and 23). Moreover, if the amount of the solvent which carries out the regurgitation from a discharge head is adjusted (it increases), solubility is enlarged and the height of the part of ink non-passed section 2c is made low as shown in drawing 5, the amount of the ink with which the part corresponding to ink non-passed section 2c is filled up can be reduced, and the amount of the ink discarded at the time of the ** version can be saved further.

[0054] Although considered as the configuration which applies a solvent 22 from a discharge head with this operation gestalt, you may make it the resin liquid which replaced with the solvent 22 and dissolved the resin of arbitration with the solvent, and a configuration which is made to carry out thermofusion of the resin and applies it. As for the resin chosen, at this time, it is desirable that it is especially the same as that of the raw material of the field of affinity with the porous resin film 2 to the porous resin film 2. However, the method which applies a solvent 22 like this operation gestalt from the field of the simple nature of cost or a device is desirable.

[0055] It is conveyed with the conveyance roller 7, the master [finishing / platemaking] 2 being guided by the guide plate 6 in the point, and the point reaches on the stage section 15 of the maintenance means 14 soon. Recognition of the control unit (for example, Maine controller of the mimeograph airline printer 1) which does not illustrate that the point of a master 2 reached to the maintenance location of the maintenance means 14 outputs an actuation instruction to the closing motion means which is not illustrated. A closing motion means operates by this, a clasper 16 closes, and the point of a master 2 is pinched between the stage section 15 and a clasper 16. If the point of a master 2 is held by the maintenance means 14, the driving means which drives a print drum 8 will operate, and a print drum 8 will be rotated in the direction of a counterclockwise rotation at the almost same rate as the master bearer rate of the conveyance roller 7. Thereby, the peripheral face of a print drum 8 begins to be looped around a master 2. If predetermined die-length looping around of the master 2 is carried out, the cutting means 5 will cut a master 2 and looping around of the master 2 to a print drum 8 will be completed.

[0056] Printing is performed after the ** version completion. The print sheet 42 which is pinched by resist roller pair 41 and is standing by has timing taken, and is sent to the contact section (imprint section) of a print drum 8 and a press roller 38. If a print sheet 42 is pressed by the peripheral face (strictly external surface of a master 2) of a print drum 8 by the press roller 38, the ink supplied by the ink supply means 9 will pass through the part in which ink non-passed section 2c of a master 2 is not formed, and will be imprinted, and an image will be formed in the front face of a print sheet 42 (claim 24). The print sheet 42 which had the image formed exfoliates from the peripheral face of a print drum 8 with the exfoliation pawl 43, and a stack is discharged and carried out to a paper output tray 46.

[0057] Next, other operation gestalten are explained based on drawing 6. As long as the same sign shows the same part as the above-mentioned operation gestalt and there is especially no need, the explanation on the configuration already carried out and a function is omitted. Moreover, except platemaking equipment, since it is the same as that of the above-mentioned operation gestalt, the illustration and explanation are omitted. The platemaking equipment 180 in this operation gestalt is replaced with the solvent spreading means 3 in the above-mentioned operation gestalt, and it has the platen roller 60 which conveys a master 2, pressing a master 2 to the thermal head 59 and this thermal head 59 as a heating means which is based on image information, and heats and fuses a master 2 alternatively (claims 12, 20, and 23). With this operation gestalt, the desiccation means 4 turns into a cooling means. The thermal head 59 is formed free [attachment and detachment] to the platen roller 60 by the attachment-and-detachment means which is not illustrated. The platen roller 60 is supported by the mimeograph airline printer body free [rotation], and a rotation drive is carried out with the stepping motor which is not illustrated.

[0058] The thermal head 59 has structure as shown in drawing 7. (c) is drawing which looked at the minute exoergic section in a thermal head 59 from the top face, and (b) shows the sectional view. In sign 1A, sign 1B shows a lead electrode and sign 1C shows the protective coat for the heating element layer by the high electric resistance ingredient, respectively. Lead electrode 1B is omitting in (b). Heating element layer 1A is formed on Substrate E. If an electrical potential difference is impressed among lead electrode 1B, a current will flow to heating element layer 1A between lead electrode 1B, and heating element layer 1A of a current-carrying part will generate heat with the Joule's heat. Such the minute exoergic section is closely arranged in the fixed pitch to the main scanning direction, resin section 2a corresponding to the non-image section fuses and deforms it, a master 2 being conveyed in the direction of vertical scanning, and opening 2b is closed. By ventilation being performed by the cooling means 4 and cooling, ink non-passed section 2c solidified on the master 2 is formed (claims 13, 21, and 23).

[0059] If the energy for melting is supplied to the exoergic section of a thermal head 59 in the form of electrical energy, this energy will be transformed into heat energy by heating element layer 1A, and the temperature of the porous resin film 2 in contact with protective coat 1C will rise. It seems that the temperature distribution at this time are shown in (a). The porous resin film 2 is the threshold temperature by which melting is carried out, and Sign D can form in a main scanning direction the resin film with which opening 2b continued and it was closed by applying the temperature beyond this threshold temperature. Moreover, in the direction of vertical scanning, the resin film with which opening 2b was closed continuously can be similarly formed by adjusting the size of heating element layer 1A of the direction of vertical scanning, and the resistance welding time to heating element layer 1A so that the temperature beyond threshold temperature may be continuously applied to a master 2.

[0060] A platen roller 60 starts rotation, a master 2 is conveyed and the platemaking to the master 2 in platemaking equipment 180 is started. It leaves the image field 48 and the corresponding part 49 at drawing 3 so that it may be

shown, and heating and melting by the thermal head 59 are made by the master 2. Resin section 2a by which melting was carried out is ventilated and cooled with the cooling means 4, and ink non-passed section 2c solidified on the master 2 is formed. On the porous resin film 2, an antistatic agent, a stick inhibitor, a surfactant, antiseptics, *****, etc. can be used together within limits which do not check an ink non-passed section formation function.

[0061] Next, other operation gestalten are explained based on drawing 8. In addition, as long as the same sign shows the same part as the above-mentioned operation gestalt and there is especially no need, the explanation on the configuration already carried out and a function is omitted. It is characterized by making the platemaking side of a master 2 contact the peripheral face of a print drum 8, and looping this operation gestalt around it, the hand of cut of a print drum 8 only differs from the location of a clamper 16 etc., and it is the same configuration as the first operation gestalt. the master [finishing / platemaking] 2 — a conveyance roller pair — it is sent towards the clamper 16 in the condition that 65 opened, and a point is pinched and it is looped around. As shown in drawing 9, the condition that the platemaking side contacts the peripheral face of a print drum 8 is looped around a master 2 (claim 25). For this reason, restoration of ink is not performed to ink non-passed section 2c which is the non-image section, but the ink discarded at the time of the ** version can be saved. In the configuration using the platemaking equipment 180 shown by drawing 6, it can carry out similarly.

[0062] In each above-mentioned operation gestalt, the so-called effective image field where ink adheres, and the field where ink does not adhere exist in the master 2 around which the peripheral face of a print drum 8 was usually looped. It does not dare perform formation processing of ink non-passed section 2c in the field to which ink does not adhere with a natural thing.

[0063] Although the master 2 which consists only of porous resin film was used with each above-mentioned operation gestalt, the laminating of the porous fiber film which consists of fiber on the porous resin film may be carried out for reinforcement. As porous fiber film, tissue paper, such as semi-synthetic fibers, such as synthetic fibers, such as regenerated fibers, such as natural fibers, such as animal fibers, such as mineral fibers, such as glass, sepiolite, and various metals, wool, and silk, cotton, Manila hemp, a kozo, Edgeworthia, and pulp, a staple fiber, and rayon, polyester, polyvinyl alcohol, and an acrylic, and a carbon fiber, and an inorganic fiber which has whisker structure, is mentioned. In this case, the size of fibrous material is 1–10 micrometers preferably the diameter of 20 micrometers or less. If larger [when a diameter is smaller than 1 micrometer, tensile strength is weak, and] than 20 micrometers, ink passage will be barred and the white omission by the so-called fiber will appear in an image. Moreover, about 0.1–10mm is desirable still more desirable, and the die length of fibrous material is about 1–6mm. If shorter than 0.1mm, tensile strength will become weak, and if longer than 10mm, distribution will be hard to be carried out to homogeneity. Moreover, it may replace with the porous fiber film and the porous film which consists of the mesh screen which consists of nylon fiber metallurgy group fiber etc., a porous sheet which has many through tubes, or a film may be used. Moreover, a pattern may be printed by the printing approaches, such as gravure, offset, and flexo one, or the porous film may be formed by nozzle coating etc.

[0064]

[Effect of the Invention] According to invention according to claim 1, since the master for mimeograph printing was formed only from the porous resin film, it excels in conveyance nature and printing quality, and the low cost master for mimeograph printing can be obtained.

[0065] According to invention according to claim 2, since the porous resin film has the structure which has many openings in the membranous interior and a membranous front face, it can obtain good ink permeability.

[0066] Since it considered as the configuration in which an opening continues and exists in the membranous thickness direction according to invention according to claim 3, good ink permeability can be obtained.

[0067] According to invention according to claim 4, since the thickness of the porous resin film considered as 5–micrometer or more configuration which is 50 micrometers or less, it can obtain good print durability and can control generating of the elongation of an image.

[0068] According to invention according to claim 5, the consistency of the porous resin film is 0.1 g/cm³. It is 0.7 g/cm³ above. Since it considered as the configuration which is the following, good film reinforcement can be obtained.

[0069] Since the average aperture of the porous resin film considered as 5–micrometer or more configuration which is 30 micrometers or less according to invention according to claim 6, sufficient ink through put can be obtained without causing a blot of an image.

[0070] Since [according to invention according to claim 7] it engraves while processing so that ink cannot pass the part corresponding to the non-image section based on the image information for the master for mimeograph printing which consists only of porous resin film, while the problem resulting from the base material of the conventional master is solvable, conveyance nature and printing quality can be raised.

[0071] Since [according to invention according to claim 8, 10, or 11] it processes so that a solvent may be applied and ink cannot be passed, while the problem resulting from the base material of the conventional master is solvable, conveyance nature and printing quality can be raised.

[0072] Since according to invention according to claim 9 it carried out to making it dry compulsorily after applying a solvent, a chemical reaction part can be dried and solidified efficiently and ink the non-passed section can be formed with high precision.

[0073] Since [according to invention according to claim 12] it processes so that heating fusion may be carried out with a heating means and ink cannot be passed, while the problem resulting from the base material of the conventional master is solvable, conveyance nature and printing quality can be raised.

[0074] Since according to invention according to claim 13 it carried out to making it cool compulsorily after carrying out heating fusion, at least a fusion zone can be solidified efficiently and ink the non-passed section can be formed with high precision.

[0075] Since [according to invention according to claim 14] the stripped plane in the manufacture of the porous resin film is made into a platemaking side, from smooth nature being good, a stripped plane is uniform and can perform high platemaking of precision.

[0076] Since it considered as the configuration which has the ink non-passed section means forming processed so that ink cannot pass the part corresponding to the non-image section based on the image information of the master for mimeograph printing which consists only of porous resin film according to invention according to claim 15 or 23, while the problem resulting from the base material of the conventional master is solvable, conveyance nature and printing quality can be raised.

[0077] Since ink non-passed section means forming considered as the configuration which is a solvent spreading means to apply a solvent to the part corresponding to the non-image section according to invention according to claim 16, 18, 19, or 23, while the problem resulting from the base material of the conventional master is solvable, conveyance nature and printing quality can be raised.

[0078] Since it considered as the configuration which has the desiccation means on the master conveyance direction lower stream of a river of a solvent spreading means according to invention according to claim 17 or 23, a chemical reaction part can be dried and solidified efficiently and ink the non-passed section can be formed with high precision.

[0079] Since ink non-passed section means forming considered as the configuration which is the heating means which carries out heating fusion of the part corresponding to the non-image section according to invention according to claim 20 or 23, while the problem resulting from the base material of the conventional master is solvable, conveyance nature and printing quality can be raised.

[0080] Since it considered as the configuration which has the cooling means on the master conveyance direction lower stream of a river of a heating means according to invention according to claim 21 or 23, at least a fusion zone can be cooled and solidified efficiently and ink the non-passed section can be formed with high precision.

[0081] Since [according to invention according to claim 22] the stripped plane in the manufacture of the porous resin film is made into a platemaking side, from smooth nature being good, a stripped plane is uniform and can perform high platemaking of precision.

[0082] According to invention according to claim 24, the master for mimeograph printing which consists only of porous resin film It engraves processing so that ink cannot pass the part corresponding to the non-image section based on the image information. Since the peripheral face of a print drum is looped around the master for mimeograph printing which engraved and it prints by supplying ink from the interior of a print drum, while the problem resulting from the base material of the conventional master is solvable, conveyance nature and printing quality can be raised.

[0083] According to invention according to claim 25, the master for mimeograph printing which consists only of porous resin film It engraves processing so that ink cannot pass the part corresponding to the non-image section based on the image information. Since the peripheral face of a print drum is looped around the master for mimeograph printing which engraved so that the platemaking side may become inside, and it prints by supplying ink from the interior of a print drum, the ink discarded at the time of the ** version can be saved.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the outline front view of the mimeograph airline printer concerning 1 operation gestalt of this invention.

[Drawing 2] It is the outline sectional view of a master.

[Drawing 3] It is the perspective view showing the correspondence relation of the image part of a manuscript and a master.

[Drawing 4] It is a sectional view in the A-A line of drawing 3 .

[Drawing 5] It is a sectional view in the A-A line of drawing 3 in other operation gestalten.

[Drawing 6] It is the outline front view of the platemaking equipment in other operation gestalten.

[Drawing 7] It is drawing showing the thermal head in the operation gestalt shown by drawing 6 , and the sectional view of the exoergic section and (c of the graph with which (a) shows a heat characteristic, and (b)) are the top views of the exoergic section.

[Drawing 8] It is the outline front view of the mimeograph airline printer in other operation gestalten.

[Drawing 9] It is the outline sectional view of the master in the operation gestalt shown by drawing 8 .

[Description of Notations]

2 Porous Resin Film

3 Solvent Spreading Means as Ink Non-Passed Section Means Forming

4 Desiccation Means or Cooling Means

59 Thermal Head as a Heating Means

110,180 Platemaking equipment

[Translation done.]

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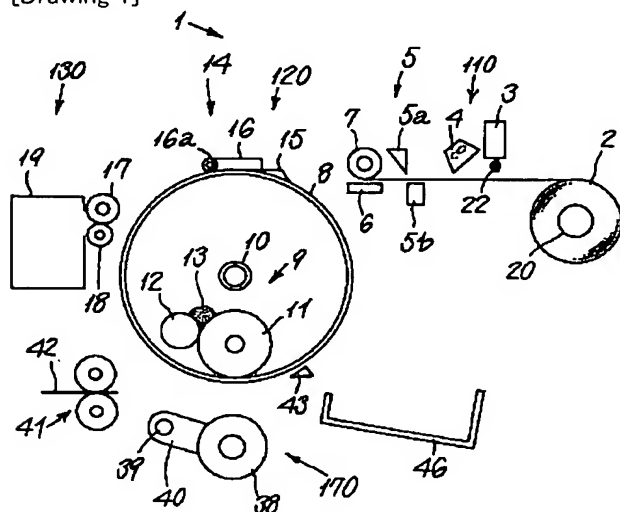
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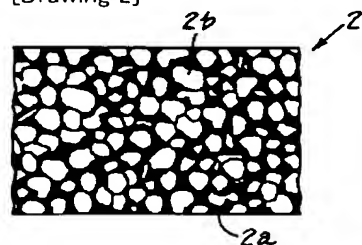
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DRAWINGS

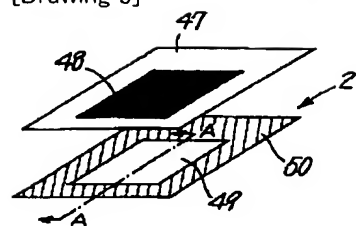
[Drawing 1]



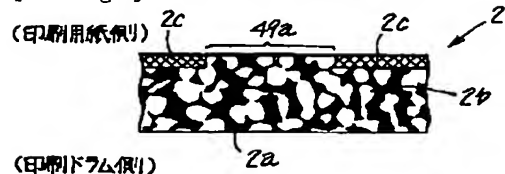
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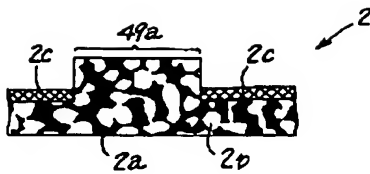
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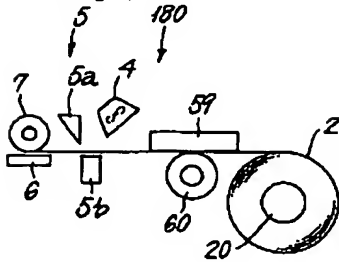
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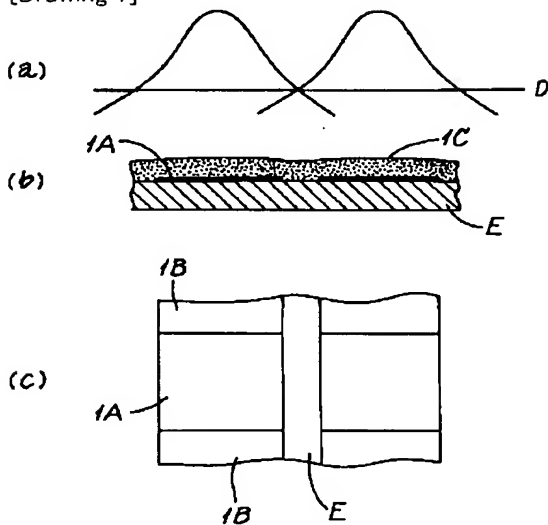
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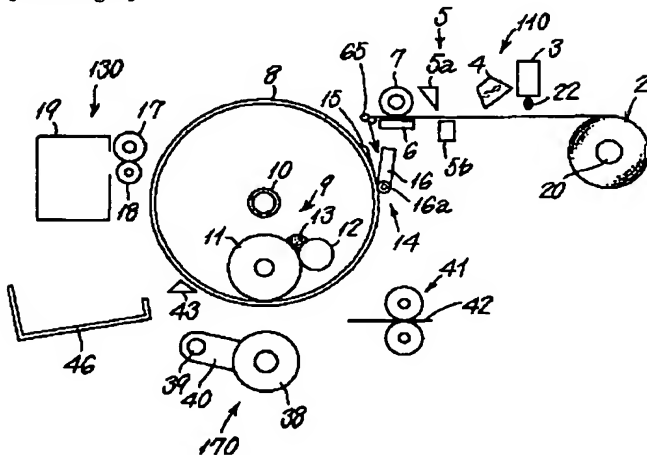
[Drawing 6]



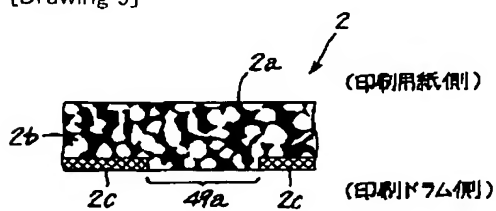
[Drawing 7]



[Drawing 8]



[Drawing 9]



[Translation done.]